

In the claims:

Claims 4-6 are amended to read as follows.

4. (Amended) An apparatus for determining component flow rates of a multiphase fluid in a conduit, the fluid consisting of at least three known components, the apparatus comprising:

- a) means for measuring at each of two different positions along the conduit at least four mixture quantities;
- b) means for providing a speed of sound in each of the components at the measured pressures and temperatures;
- c) means for providing a trial value for each of either the component flow rates or the phase fractions;
- d) means for using a predetermined model to calculate values for the measured mixture quantities based on the trial values for each of either the component flow rates or the phase fractions;
- e) means for using a predetermined error function to determine an error value; and
- f) means for using a predetermined optimizing algorithm to determine whether the calculated values are acceptable, and, if they are not, to provide a new trial value for each of either the component flow rates or the phase fractions.

5. (Amended) An apparatus as in claim 4, wherein the error function is the sum of the squares of the difference between the measured and calculated values at each point.

6. (Amended) An apparatus as in claim 4, wherein the four mixture quantities are the sound speed, the flow velocity of the multiphase fluid, the pressure and the temperature.